

11. 0.11/0.23 points | Previous Answers IllowskyIntroStat1 8.HW.104.

My Notes Ask Your Teacher

In six packages of "The Flintstones® Real Fruit Snacks" there were five Bam-Bam snack pieces. The total number of snack pieces in the six bags was 63. We wish to calculate a 96% confidence interval for the population proportion of Bam-Bam snack pieces.

Part (a)

Define the random variables  $X$  and  $P'$  in words.

- ☐  $X$  is the number of Bam-Bam snacks in a sample of 63 snack pieces.  $P'$  is the proportion of Bam-Bam pieces in a bag of snacks.
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Part (b)

Which distribution should you use for this problem? (Enter your answer in the form  $z$  or  $t_{df}$  where  $df$  is the degrees of freedom.)

$t_{df}$

Explain your choice.

- ☐ The Student's  $t$ -distribution should be used because we do not know the standard deviation.
- ☒ The Student's  $t$ -distribution should be used because  $\sqrt{npq} \leq 10$ , which implies a small sample.
- ☐ The binomial distribution should be used because the two outcomes are "Bam-Bam" and "Not Bam-Bam".
- ☐ The standard normal distribution should be used because we are interested in proportions.

Part (c)

Calculate  $p'$ . (Round your answer to three decimal places.)

$p' = 0.079$

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Calculate  $p'$ . (Round your answer to three decimal places.)

$p' = 0.079$  ✓

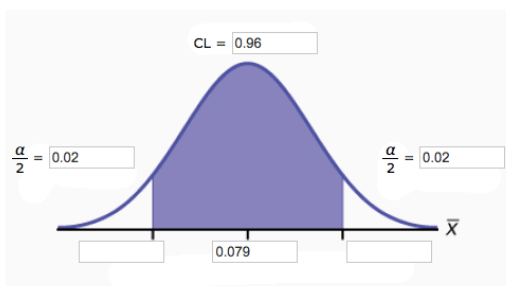
Part (d)

Construct a 96% confidence interval for the population proportion of Bam-Bam snack pieces per bag. (Round your answers to three decimal places.)

(i) State the confidence interval.

(  ,  )

(ii) Sketch the graph.



(iii) Calculate the error bound.

Part (e)

(e) Do you think that six packages of fruit snacks yield enough data to give accurate results? Why or why not?

☐ Yes, this is clearly a simple random sample.


☒ No, we do not know if this sample was obtained from a simple random sample.

6.  0/0.016 points | [Previous Answers](#) IllowskyIntroStat1 8.PR.062.

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Marketing companies are interested in knowing the population percent of women who make the majority of household purchasing decisions.

When designing a study to determine this population proportion, what is the minimum number you would need to survey to be 90% confident that the population proportion is estimated to within 0.05? (Round your answer up to the nearest whole number.)

 women

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A magazine published data on the best small firms in a certain year. These were firms that had been publicly traded for at least a year, have a stock price of at least \$5 per share, and have reported annual revenue between \$5 million and \$1 billion. The table below shows the ages of the corporate CEOs for a random sample of these firms.

48	58	50	61	57
59	74	63	53	50
59	60	60	57	46
55	63	57	47	55
57	43	61	62	49
67	67	55	55	49

Use this sample data to construct a 90% confidence interval for the mean age of CEO's for these top small firms. Use the Student's  $t$ -distribution. (Round your answers to two decimal places.)

(  ,  )

Enter a number.

⚠ Your work in question(s) 11 will also be submitted or saved.

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Practice Another Version

Among various ethnic groups, the standard deviation of heights is known to be approximately three inches. We wish to construct a 95% confidence interval for the mean height of males from a certain country. Forty-six males are surveyed from a particular country. The sample mean is 72 inches. The sample standard deviation is 2.6 inches.

**Part (a)**

Find the following. (Enter exact numbers as integers, fractions, or decimals.)

(i)  $\bar{x} =$   ✓

(ii)  $\sigma =$   ✓

(iii)  $n =$   ✓

**Part (b)**

In words, define the random variables  $X$  and  $\bar{X}$ .

- ☒  $X$  is the height of a male from this country, and  $\bar{X}$  is the mean height from a sample of 46 males.
- ☐  $X$  is the mean height from a sample of 46 males, and  $\bar{X}$  is the height of a male from this country.
- ☐  $X$  is the number of males in this country, and  $\bar{X}$  is the number of males in the study.
- ☐  $X$  is the number of males in the study, and  $\bar{X}$  is the number of males in this country.

**Part (c)**

Which distribution should you use for this problem? Explain your choice.

- ☒ The standard normal distribution should be used because the population standard deviation is known.
- ☐ The Student's  $t$ -distribution should be used because the sample mean is smaller than 30.
- ☐ The Student's  $t$ -distribution should be used because the sample standard deviation is given.
- ☐ The standard normal distribution should be used because the mean is given.



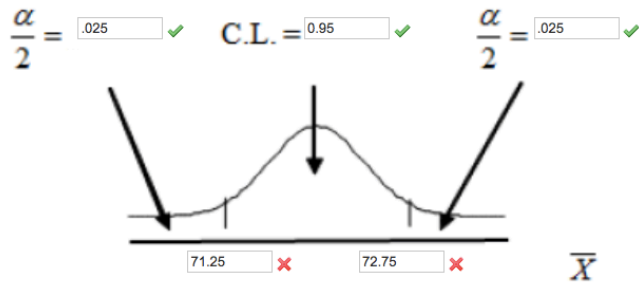
Part (d)

Construct a 95% confidence interval for the population mean height of males of this country.

(i) State the confidence interval. (Round your answers to two decimal places.)

( 71.25 ✖ , 72.75 ✖ )

(ii) Sketch the graph.



(iii) Calculate the error bound. (Round your answer to two decimal places.)

0.75 ✖

Part (e)

What will happen to the level of confidence obtained if 1,000 males are surveyed instead of 46? Why?

- ☐ The confidence interval will increase in size, because an increase in sample size decreases variability, which means a larger interval will be needed to capture the true population mean.
- ☒ The confidence interval will increase in size, because an increase in sample size increases variability, which means a larger interval will be needed to capture the true population mean.
- ☐ The confidence interval will decrease in size, because an increase in sample size decreases variability, which means a smaller interval will be enough to capture the true population mean.
- ☐ The confidence interval will decrease in size, because an increase in sample size increases variability, which means a smaller interval will be enough to capture the true population mean.

✖

An article regarding interracial dating and marriage recently appeared in a newspaper. Of the 1716 randomly selected adults, 307 identified themselves as Latinos, 321 identified themselves as blacks, 255 identified themselves as Asians, and 778 identified themselves as whites. Among Asians, 79% would welcome a white person into their families, 71% would welcome a Latino, and 66% would welcome a black person.

NOTE: If you are using a Student's t-distribution, you may assume that the underlying population is normally distributed. (In general, you must first prove that assumption, though.)

**Part (a)**

Construct the 95% confidence intervals for the three Asian responses. (Round your answers to four decimal places.)

welcome a white person (  ,  )

welcome a Latino (  ,  )

welcome a black person (  ,  )

**Part (b)**

Even though the three point estimates are different, do any of the confidence intervals overlap? Which? (Select all that apply.)

- ☒ Yes, the intervals for whites and Latinos overlap.
- ☐ Yes, all three intervals overlap.
- ☐ No confidence intervals overlap.
- ☒ Yes, the intervals for Latinos and blacks overlap.
- ☐ Yes, the intervals for whites and blacks overlap.

